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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,210	01/25/2002	William Thomas Pike	01-10-1758	3904

23388 7590 06/25/2003

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EXAMINER

BELLAMY, TAMIKO D

ART UNIT PAPER NUMBER

2856

DATE MAILED: 06/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/058,210

Applicant(s)

PIKE ET AL.

Examiner

Tamiko D. Bellamy

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang (5,447,068).

With respect to claim 1, Tang discloses in Figs. 1 and 2 a substrate 14 carrying one or more fixed plates (col. 1, lines 5-10), a movable conductor 17 that is supported by a suspension 22, and a movable conductor 17 that includes a common plate 24 that branches out into a plurality of plates 26 (col. 3, lines 12-15). The common plate 24 is equivalent to a proof mass. The pluralities of plates 26 are equivalent to a second capacitor array. Furthermore, Tang discloses two stationary electrodes 32, 38 (col. 6, lines 52-54). The plates 32, 38 are equivalent to a first capacitor array. Tang discloses that the suspension 22 is fabricated with a plurality of eight supporting beams 23; and the beams permit movement in the x direction but prohibit side-to-side movement of the movable electrode 17 (col. 6, lines 12-30). Finally, Tang discloses a control 70 that is coupled by conductors 72, 74, and 76 to electrode sections 56, 57, and 17 (col. 7, lines 17-19). The supporting beams 23 are equivalent to a plurality of flexures. The control 70 is equivalent to feedback electronics. As shown in figures 1 and 2 the suspension including supporting beams 23 are attached to a frame portion. Tang lacks the detail of

the device in which Tang discloses makes use of a movable conductor 17 including a plurality of plates 26 that form an in-plane one-piece construction. The arrangement of components is a design consideration clearly within the preview of one of ordinary skill in the art.

With respect to claims 2-4, 10-12, and 22 Tang discloses in Figs. 1-3 an electrostatically driven microcantilever (col. 5, line 15), and the top and bottom electrodes 32 and 26 are activated by a control 70 (col. 7, lines 16-17). Furthermore, Tang discloses that when the applied voltage reaches the threshold that pull the sprung plate 24 against the fixed plate, the current pulse generated is used to latch the control signal registration with the applied voltage signal as an indication of acceleration force. Hence, the plates are then released and another incrementing cycle is initiated (col. 7, lines 59-65). With respect to further limitations of claims, 3, and 11-12, Tang lacks the detail of an electromagnetic actuator. However, it is well known in the art to use electromagnetic actuators in accelerometers. Furthermore, the type of actuator used is a design choice clearly within the preview of one of ordinary skill in the art. With respect to further limitations of claims 4 and 22, Tang lacks the detail of two electromagnetic actuators. However, the duplication of the actuator is a design consideration clearly within the preview of one of ordinary skill in the art. Therefore, it would have been obvious to one of ordinary skill in the art to provide Tang with two electromagnetic actuators, so that the device provides the proof mass with an electromagnetic force that moves the proof mass in a constrained direction.

With respect to claims 5 and 6, Tang discloses in Figs. 1 and 2 a movable conductor 17 includes a common plate 24 that branches out into a plurality of plates 26 (col. 3, lines 12-15). The common plate 24 is equivalent to a proof mass. Furthermore, Tang discloses the top and bottom electrodes 32 and 26 are activated by a control 70 (col. 7, lines 16-17). Tang lacks the detail of a proof mass that is comprised of two wafers bonded together, and the actuator and the integrator feedback coils that are located centrally between the two wafers. However, it is well known in the art to use a proof mass formed from bonding two wafers together. Furthermore, the placement actuators are a design consideration clearly within the preview of one of ordinary skill in the art. Therefore, it would have been obvious to one of ordinary skill in the art to provide Tang with a proof mass that is constructed from two wafers and including an actuator, so that device incorporates an actuator that generates an electromagnetic force signal that propagates through the proof mass causing the proof mass to move in a constrained direction.

With respect to claims 7-9, Tang discloses the top and bottom electrodes 32 and 26 are activated by a control 70 (col. 7, lines 16-17). The control 70 is equivalent to feedback electronics. Tang lacks the detail of an additional electromagnetic actuator. However, the duplication of the actuator is a design consideration clearly within the preview of one of ordinary skill in the art. Therefore, it would have been obvious to one of ordinary skill in the art to provide Tang with two actuators, so that the device provides the acceleration force.

With respect to claims 13-15, Tang discloses a control 70 that is coupled by conductors 72, 74, and 76 to electrode sections 56, 57, and 17 (col. 7, lines 17-19). Tang also discloses a logic control 70, such as a microprocessor (col. 7, line 56). The control 70 is equivalent to feedback electronics. Finally, Tang discloses a bottom conductor 12 secured to a substrate 14 (col. 3, lines 5-6), and the base 12 includes layer sections 56 and 57 (col. 4, lines 49-50). Therefore, the control 70 is integrated to the substrate 14 via conductor 12.

With respect to claims 16-18, Tang discloses in figs. 1 and 2 two sets of electrodes labeled as forward electrodes and backward electrodes operate differentially (co. 4, lines 41-48). Furthermore, Tang discloses the suspension 22 is fabricated with a plurality of eight supporting beams 23; and the beams permit movement in the x direction but are rigid in the y direction to prohibit side to side movement of the movable electrode 17 (col. 6, lines 12-30). Hence, Tang discloses that when the suspended structure experiences force in the x direction, it is displaced in the y direction (col. 6, lines 66-68).

With respect to claims 19-21, Tang discloses the double-folded beam design provides high sensitivity rejection. Furthermore, Tang discloses that the system is compliant in the lateral x direction and is very stiff in the lateral y direction. Finally, Tang discloses that the out-of-plane z motion is impeded effectively by squeeze-film damping between the structure and the substrate (col. 4, lines 31-38).

### *Conclusion*

3. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

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The following patents are cited to further show the state of art with respect to a proof mass constructed from two wafers:

U.S. Pat. No. (6,481,286) to Bernstein et al.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamiko D. Bellamy whose telephone number is (703) 305-4971.

The examiner can normally be reached on Monday through Friday 9:00 AM to 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Tamiko Bellamy

T.B.

April 24, 2003

HELEN KWOK  
PRIMARY EXAMINER

*Helen Kwok*